

## CHAPTER 12.0

### CONTRACTING OF GEOTECHNICAL SUBSURFACE EXPLORATION

It is common practice with many agencies to outsource or contract drilling, in-situ testing, and laboratory testing programs to external sources. Whether the subsurface exploration work is performed by the agency itself or by others, it is ultimately the geotechnical engineer's responsibility to assure the appropriateness of the exploration and testing procedures. Thus, it is essential to scrutinize the qualifications, quality control, and quality assurance procedures, the equipment and personnel, the professional reputation, and the safety record of the contractor, consultant, or testing firm.

On some projects, a fulltime on-site inspector from the Owner who is technically-qualified should be present during drilling, sampling, & field testing to confirm and document the events and results. On small projects, periodic visits to observe these tasks and operations should be made by the geotechnical engineer. A visit to the testing laboratory (who may be separate from the contract driller or service company) should also be made to check sample handling and storage procedures, and the setup of triaxial, direct shear, consolidometer, permeameters, resonant column, and other devices. The general operating condition of the mechanical, electrical, hydraulic, and/or pneumatic components should be inspected and the most recent calibration curves inspected for verification that a QC/QA program has been undertaken by the testing laboratory. It should be noted that a minimum recommended QC/QA program does not exist and that the extent, scope, and quality of these programs vary greatly. Unfortunately, many public owners do not require QC/QA criteria for drilling, in-situ testing, or laboratory testing which is performed by outside contractors.

#### 12.1 DRILLING AND TESTING SPECIFICATIONS

Testing and drilling specifications should be prepared by the geotechnical engineer and the geologist. They should, as a minimum, contain clear concise statements and descriptions of the following items:

For drilling/coring:

- ' Type of the project (e.g., embankment, bridge, wall, cut slope)
- ' Location of the project
- ' Site access information
- ' Site access problems- if known
- ' Drilling site survey and borehole location information
- ' Contaminants- if applicable
- ' Special health and safety requirements
- ' Site map and topographic data
- ' Preliminary plans, if available
- ' Types of samples to be obtained
- ' Standards to be followed (ASTM, local, others)
- ' Type of equipment to be used
- ' Environmental constraints
- ' Minimum drilling/coring crew size
- ' Qualifications of the field supervisor (i.e. field geologist, engineer)
- ' Identification of who will supervise the boring/coring operations
- ' Procedures to be followed to transport samples
- ' Destination of the samples

- ' Frequency of shipping of samples
- ' Name, phone number and address of the geotechnical engineer or geologist in charge
- ' Nature and number of field tests to be performed

If the contract is for drilling, coring, sampling, & testing, the following items should be included in the information provided to the contractor:

- ' The types of drilling methods to be used
- ' Field methods and in-situ tests to be conducted
- ' Types & quantities of tests to be performed
- ' Testing standards to be followed (ASTM, AASHTO, Local)
- ' Laboratory QA/QC procedures or requirements
- ' Reporting formats and presentation of data
- ' Contents of the geotechnical report

Each request for proposal for a subsurface exploration should also contain a realistic & flexible schedule to be reviewed and accepted by the contractor. The drilling contractor should be required to provide a formal document outlining its health and safety program. Additionally, the contractor should provide the number of accidents resulting in man days lost during the previous year, as well as its insurance rating.

The contractual terms, including payments for services, liability, indemnity, failure to complete the job, etc. are normally covered by each agency's procurement or contracting office. The agency should always reserve the right to review the progress of the work and to provide on site supervision of drilling, field testing, or laboratory testing. Prior to accepting a contractor for a given project the geotechnical engineer and/or the geologist should perform an on site and paper review of the contractor's capabilities. A practice which may be considered as an integral part of the traditional advertising and selection process of contractors, is the review of the facilities, equipment and experience of the top two or three selected contractors prior to awarding a blanket or specific contract.



**Figure 12-1. Track-Mounted Drill Rig Investigating Bridge Site in Hayti, Missouri.**